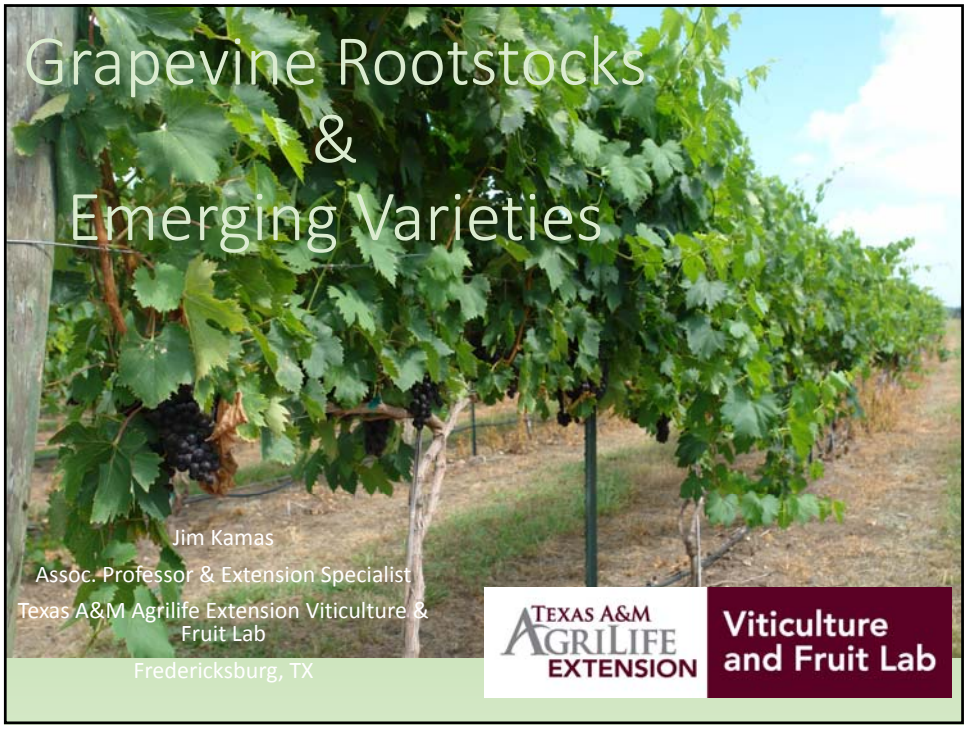


What is a Rootstock And Why Do We Need Them?

- A rootstock is a genetically distinct form of a plant joined to a scion by budding or grafting to overcome soil limitations or impart/restrict plant vigor

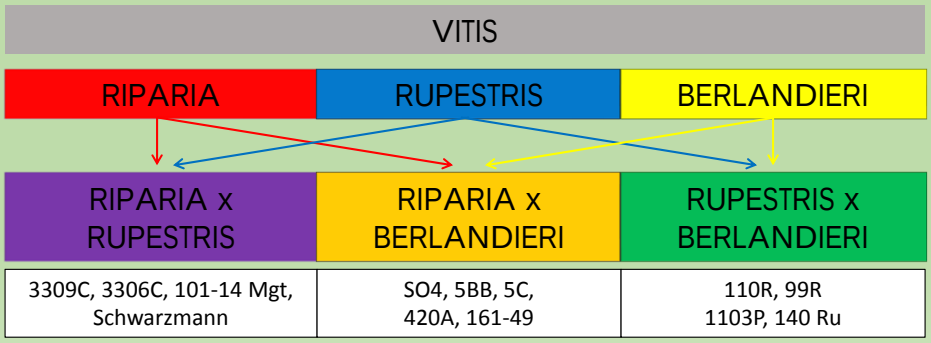
Grapevines Commonly Propagated Through Bench Grafting

Scion

Rootstock

Rootstock	Synonym	Parentage	Vigor	Pylloxera Resistance	Nematode X. Index (Dagger)	Resistance M. incognita (Root Knot)	Soil Preference	Drought Tolerance	Wet Feet	Active Lime Tolerance	Salt Tolerance	Influence on Maturity	General Comments
Riparia Gloire	Gloire de Montpellier	V. riparia	Low/ Moderate	High		Moderate	Deep/Fertile	Low	High	Low <6%		Early	
Saint George	Rupestris du Lot	V. rupestris	Very High	High		Susceptible but Tolerant	Deep, Uniform Loam	High	Low	14%	Moderate	Late	Susceptible to oak root fungus. Suitable for deep, dry farmed sites. Tends to reduce fruit set on vigorous site.
1616 Couderc	1616C	V. solonis x V. riparia	Low	Moderate/ High		Moderate	Deep/Fertile		High	11%	Moderate/ High	Early	
3309 Couderc	3309C	V. riparia x V. rupestris	Moderate/ High	High	Susceptible	Susceptible	Deep Well-Drained	Low	High	11%	Low/ Moderate	Mid	
44-53 Malegue	44-53M	V. riparia x 1443M	Moderate	Moderate/ High	Moderate	Susceptible	Loam/Good Fertility	Moderate	High	10%		Mid	Often suffers from Mg deficiency
101-14 Millardet Et De Grasset	101-14 Mgt.	V. riparia x V. rupestris	Low/ Moderate	High		Moderate	Heavy Clay	Low/ Moderate	High	9%	Very Low	Early	More vigorous than Riparia Gloire
Swarzmann	Swarzmann	V. riparia x V. rupestris	Low/ Moderate	High	High	Some	Deep/Fertile	Low/ Moderate		6-9%			
41B Millardet Et De Grasset	41B	V. berlandieri x V. vinifera		Low	Susceptible	Susceptible	Dry Lime	Low/ Moderate	Low	40%	Very Low	Early	
420A Millardet Et De Grasset	420A	V. berlandieri x V. riparia	Low	Moderate		Moderate	Deep/Fertile	Low	Moderate	20%	Low	Late	Suitable for high density plantings. Less vigorous than 5C and 5BB. Susceptible to potassium deficiency. Suitable for high density plantings.
Oppenheim #4	SO4	V. berlandieri x V. riparia	Moderate	High	High	Moderate	Clay	Low	High	18%	Low	Mid	
5BB Kober	5BB	V. berlandieri x V. riparia	Moderate	High		Moderate	Clay	Low	High	20%	Very Low	Mid	Slightly more drought tolerant than 5C or 420.A, yet less than 110R and St. George. Not recommended for sites with standing water or a history of phytophthora. Genetically identical to 5A.
5C Teleki	5C	V. berlandieri x V. riparia	Moderate	High	High	Moderate High	Clay	Low	High	20%		Early	Similar to 5BB, more suitable for higher attitudes. Broad spectrum of nematode tolerance.
1103 Paulsen	1103P	V. berlandieri x V. rupestris	High	High	Susceptible	Moderate	Clay, Lime	High	High	18%	Moderate	Late	Vigor is between 99R and 110R.
RS-3	RS-3	Ramsey x Schwarzman	Low		High	High	Sandy		Low-Medium		Medium	Medium-High	RS-3 should not be over-irrigated. Panleaf tolerant and broad nematode resistance.
RS-9	RS-9	Ramsey x Schwarzman	Medium		High	High			Low-Medium		Medium	Low	Suited for close plantings, broad nematode resistance
Kingfisher	PC01126-29	V. champinii x V. rufotomentosa x Riparia Gloire	High		Resistant	High							
Matador	PC0188-151	101-14 Mgt x (V. mustangensis x V. rupestris)	High		Resistant	High							
Minotaur	PC0188-32	101-14 Mgt x (V. mustangensis x V. rupestris	High		Resistant	High							
GRN-1	B909-05	V. Rupestris x Musacadinia	Moderate/ High	Very High	Very High	Very High		Moderate	Tolerant	Low	Low	Moderate/ High	Highly resistant to ring, citrus and lesion nematodes
GRN-2	9363-16	V. rufotomentosa x V. Champinii	Low/ Moderate	Very High	Very High	Very High		Moderate	Moderate	Moderate	Moderate?	Low/ Moderate	Highly resistant to lesion nematode and moderately resistant to citrus and ring nematode
GRN-3	9365-43	V. rufotomentosa x V. Champinii+	Moderate+	Very High	Very High	Very High		Moderate/ High	Moderate	Moderate/ High	Moderate/ High?	Moderate+	Also resists citrus and lesion nematodes, but not ring
GRN-4	9365-85	V. rufotomentosa x V. Champinii+	Moderate/ High	Very High	Very High	Very High		High	Moderate	Moderate/ High	Moderate/ High?	Moderate/ High	Also resists citrus and lesion nematodes, low to moderate ring resistance

Rootstock Selection



What Challenges Can Rootstocks Help Overcome for Texas Grape Growers?

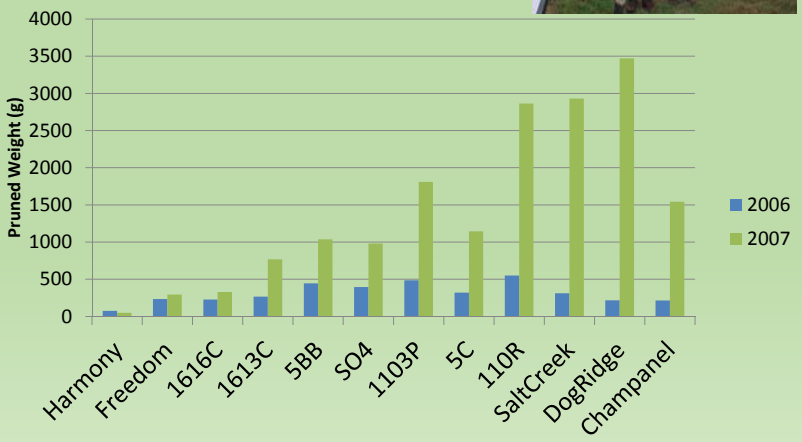
- Pierce's Disease
- Nutrient Uptake in High pH Soils
  - V. berlandieri hybrids
- Soil-borne Threats
  - Cotton Root Rot
  - Nematodes
  - Phylloxera
- Vigor Control
  - Fertile or Limiting Site?
- Other Soil Limitations
  - Sodic Soils & Water
  - Drought

Tow Rootstock Trial Vine Response Parameters

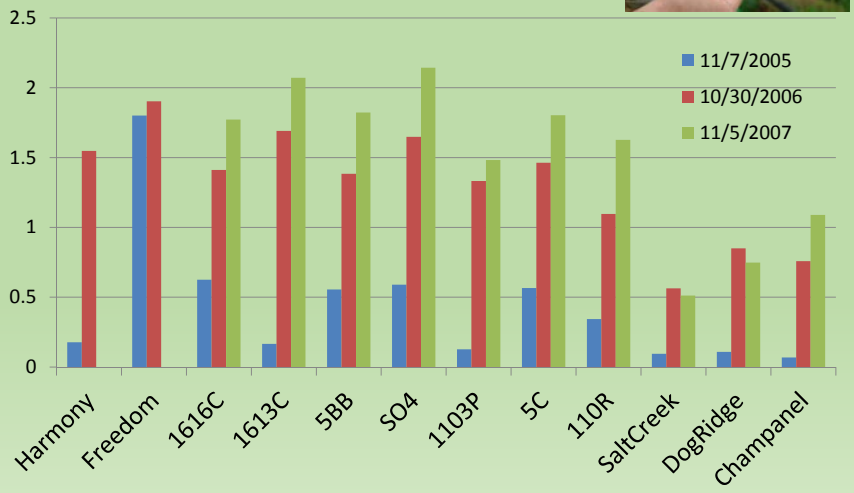
- PD Symptom Ratings
- Annual Dormant Pruning Weights
- ELISA Testing (Optical Density)

Vines Were Planted in 2005, Measurements Taken 2005, 2006, 2007 with Final Pruning Weights Taken Spring, 2008

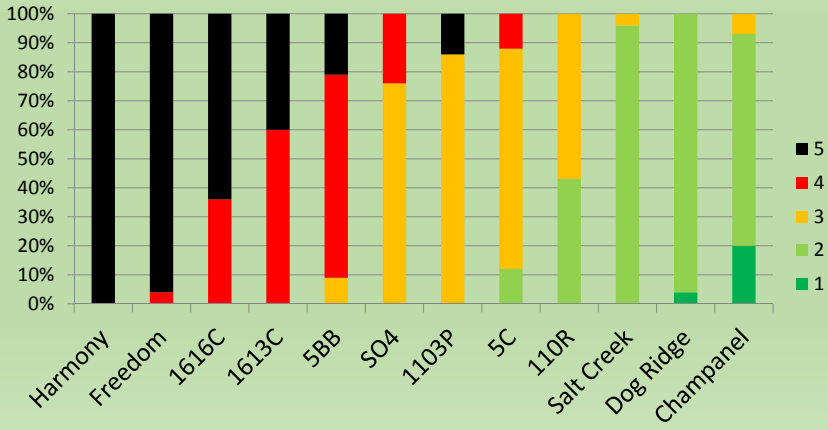
Diversity of Response- Annual Pruning Weights



Diversity of Response- ELISA Values



Diversity of Response- Visual Disease Ratings



PD symptom scores in 2007: 1 lowest – 5 dead

Expanded Rootstock Trials

Root Systems Evaluated

GRN-1	**GRN-2**	**GRN-3**	**GRN-4**
GRN-5	**Florilush**	**5BB**	**Own-Rooted**
Dogridge	**1103P**	**Salt Creek**	**5C**

Rootstock trial sites:

- 'Sangiovese'
  - Leakey
  - Stonewall
- 'Blanc du Bois'
  - Industry

Fairly Large Scale Replicated Plots

Data Collected

- Annual Pruning Weights
- Phenology
- Fruit Chemistry
- Visual Nutrient Deficiency Ratings
- Bloom and 70 Day Post Bloom Petiole Analysis

Table 3. Pruning weights for the Gillespie County and Real County.

	Pruning Weight (kg)							
	Gillespie County					Real County		
	2012[b]	2013	2014	2015	2016	2012	2013	2014
Rootstock								
FL	0.53a[c]	0.58a	0.83ab	1.20a	1.16bd	0.13bc	0.32df	0.12cd
DR	0.44ab	0.47ac	0.82ab	1.21a	1.21ac	0.19ab	0.83a	0.53a
3P	0.39ac	0.43ac	0.58be	0.84bd	0.90ce	0.13bc	0.40ce	0.17cd
G3	0.39ac	0.55ab	0.73ac	1.10ab	1.59a	0.14ac	0.42ce	0.15cd
G1	0.39ac	0.38c	0.62ae	0.82cd	0.81de	0.15ac	0.22ef	0.06d
G2	0.38ac	0.45ac	0.67ad	1.17ab	1.39ab	0.11cd	0.73ab	0.24bc
G4	0.37ac	0.43ac	0.55ce	0.78cd	0.97ce	0.01cd	0.18f	0.1d
SC	0.36ac	0.41bc	0.85a	1.29a	1.45ab	0.14bc	0.41ce	0.25bc
5B	0.31bc	0.37c	0.78ac	1.18a	0.66e	0.18ab	0.54bd	0.31b
5C	0.26c	0.34c	0.55ce	1.02ad	0.94ce	0.21a	0.55bc	0.35b
SV	0.22c	0.34c	0.44de	0.70d	0.90ce	0.05d	0.17f	0.04d
G5	-[d]	0.07d	0.4e	0.77cd	0.90ce	-	0.11f	0.05d
Sig[a]	***	***	***	***	***	*	***	***

[a] ns, *, **, *** indicate not significant, and statistically significant at the 0.05, 0.01, and 0.001 levels of probability respectively.
[b] Fischer's least significant difference test.
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3P	0.39ac	0.43ac	0.58be	0.84bd	0.90ce	0.13bc	0.40ce	0.17cd
G3	0.39ac	0.55ab	0.73ac	1.10ab	1.59a	0.14ac	0.42ce	0.15cd
G1	0.39ac	0.38c	0.62ae	0.82cd	0.81de	0.15ac	0.22ef	0.06d
G2	0.38ac	0.45ac	0.67ad	1.17ab	1.39ab	0.11cd	0.73ab	0.24bc
G4	0.37ac	0.43ac	0.55ce	0.78cd	0.97ce	0.01cd	0.18f	0.1d
SC	0.36ac	0.41bc	0.85a	1.29a	1.45ab	0.14bc	0.41ce	0.25bc
5B	0.31bc	0.37c	0.78ac	1.18a	0.66e	0.18ab	0.54bd	0.31b
5C	0.26c	0.34c	0.55ce	1.02ad	0.94ce	0.21a	0.55bc	0.35b
SV	0.22c	0.34c	0.44de	0.70d	0.90ce	0.05d	0.17f	0.04d
G5	-[d]	0.07d	0.4e	0.77cd	0.90ce	-	0.11f	0.05d
Sig[a]	***	***	***	***	***	*	***	***

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DR	0.44ab	0.47ac	0.82ab	1.21a	1.21ac	0.19ab	0.83a	0.53a
3P	0.39ac	0.43ac	0.58be	0.84bd	0.90ce	0.13bc	0.40ce	0.17cd
G3	0.39ac	0.55ab	0.73ac	1.10ab	1.59a	0.14ac	0.42ce	0.15cd
G1	0.39ac	0.38c	0.62ae	0.82cd	0.81de	0.15ac	0.22ef	0.06d
G2	0.38ac	0.45ac	0.67ad	1.17ab	1.39ab	0.11cd	0.73ab	0.24bc
G4	0.37ac	0.43ac	0.55ce	0.78cd	0.97ce	0.01cd	0.18f	0.1d
SC	0.36ac	0.41bc	0.85a	1.29a	1.45ab	0.14bc	0.41ce	0.25bc
5B	0.31bc	0.37c	0.78ac	1.18a	0.66e	0.18ab	0.54bd	0.31b
5C	0.26c	0.34c	0.55ce	1.02ad	0.94ce	0.21a	0.55bc	0.35b
SV	0.22c	0.34c	0.44de	0.70d	0.90ce	0.05d	0.17f	0.04d
G5	-[d]	0.07d	0.4e	0.77cd	0.90ce	-	0.11f	0.05d
Sig[a]	***	***	***	***	***	*	***	***

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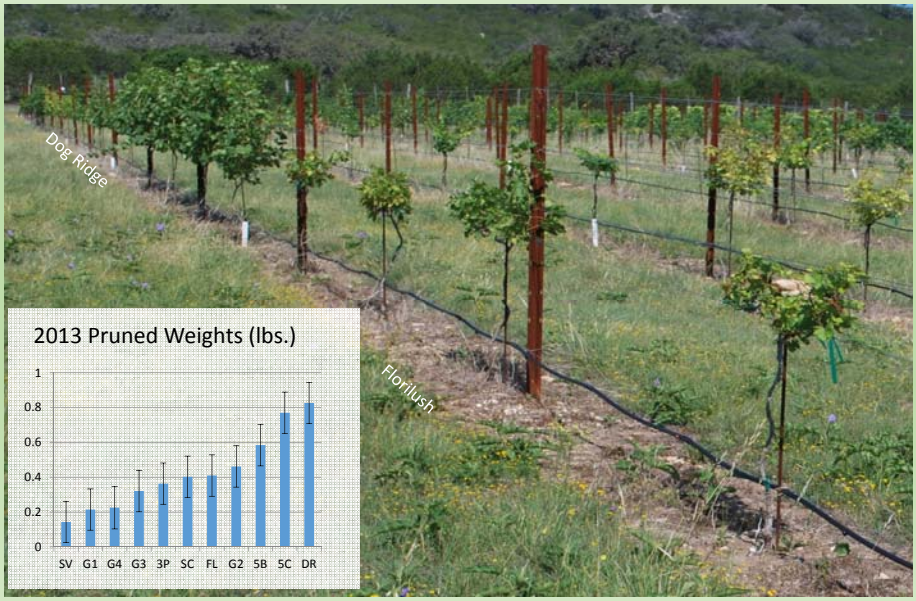
Vigor 2013-2014



Mortality to Cotton Root Rot In Real County

5B	4
5C	0
DR	2
FL	6
G1	62
G2	6
G3	18
G4	12
G5	44
RM	4
SV	8
3P	4

% Death Due to CRR

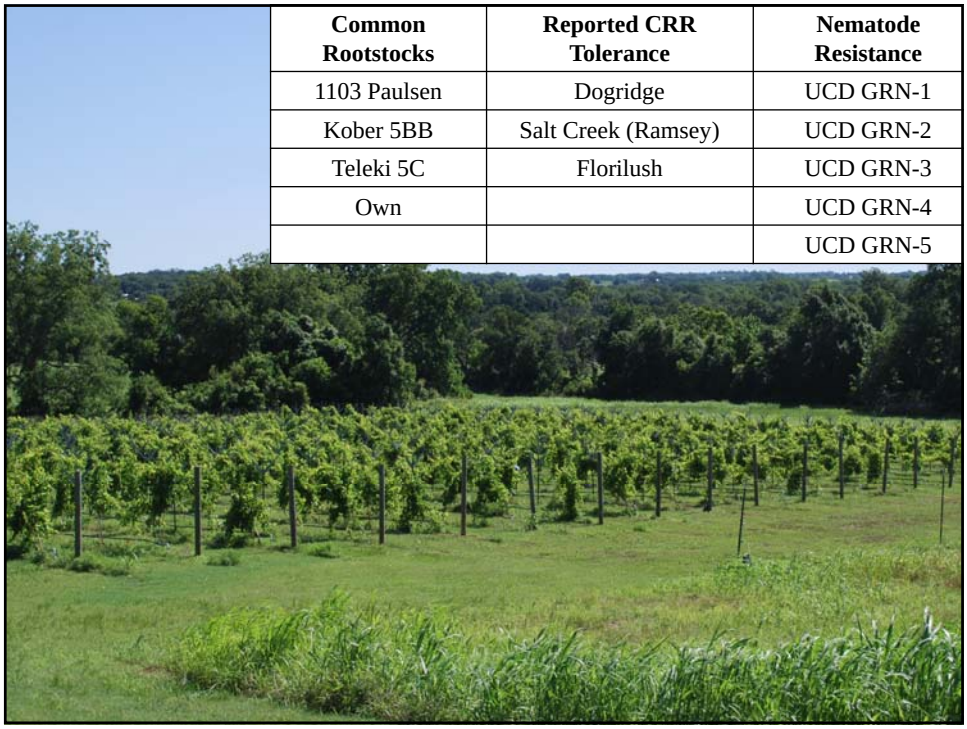
Table 1. Nutrient concentrations from tissue analysis at post-bloom in 2012 and 2013 Real County site.

Rootstock	N	P	K	Mg	Ca	Na	B	Zn	Mn
PB 2012									
G2	0.72a	0.07	2.84ac	0.60bc	4.07a	50.15	59.70a	50.15	467.02ab
G1	0.63ab	0.07	3.03ab	0.46c	3.00ac	50.70	50.97ab	50.70	498.91ab
SC	0.59ab	0.06	2.61bc	0.72ac	2.27bc	65.84	48.05ab	65.84	283.39b
SV	0.58ab	0.06	2.06d	1.06ab	3.46ac	76.26	49.47ab	76.26	326.07b
G4	0.54b	0.06	2.83ac	0.82ac	3.63ab	66.14	51.62ab	66.14	628.24ab
DR	0.51b	0.05	3.20a	0.92ac	2.66ac	113.78	48.72ab	113.78	710.78ab
FL	0.50b	0.05	2.56bd	1.09a	3.51ac	85.21	48.91ab	85.21	616.51ab
5B	0.49b	0.05	2.65bc	0.89ac	2.92ac	91.75	49.54ab	91.75	856.69a
5C	0.49b	0.07	2.99ab	0.82ac	3.09ac	69.04	53.34ab	69.04	696.25ab
3P	0.48b	0.05	2.42cd	1.00ab	2.07c	76.09	47.63b	76.09	643.88ab
G3	0.47b	0.06	2.71ac	0.93ac	3.12ac	79.05	55.47ab	79.05	857.55a
G5	-	-	-	-	-	-	-	-	-
Sig[a]	***	ns	***	***	***	ns	*	ns	***
PB 2013	**N**	**P**	**K**	**Mg**	**Ca**	**Na**	**B**	**Zn**	**Mn**
5B	0.59	0.040	1.94	0.97	3.05a	0.13	31.75	66.72	409.32ab
G3	0.55	0.038	2.25	0.89	2.96ab	0.13	30.80	68.74	369.92ab
G2	0.55	0.040	2.15	0.64	2.81ab	0.10	31.00	65.45	465.48ab
DR	0.56	0.038	2.21	0.98	2.77ab	0.13	34.40	66.32	529.50a
SV	0.55	0.042	2.12	1.07	2.65ab	0.16	33.00	75.50	357.90ab
FL	0.56	0.043	2.19	0.80	2.63ab	0.12	33.50	65.85	359.30ab
G4	0.54	0.040	1.97	0.84	2.53ab	0.11	30.67	70.00	304.50ab
5C	0.56	0.042	1.84	0.84	2.45ab	0.14	29.00	71.46	384.22ab
G1	0.55	0.050	2.62	0.73	2.35ab	0.10	32.67	68.30	292.58b
SC	0.51	0.040	1.97	0.72	2.35ab	0.11	34.25	63.52	398.88ab
G5	0.54	0.033	2.25	0.93	2.25ab	0.13	28.67	75.47	459.70ab
3P	0.52	0.048	2.09	0.88	2.11b	0.12	33.00	59.34	425.76ab
Sig[a]	ns	ns	ns	ns	***	ns	ns	ns	*

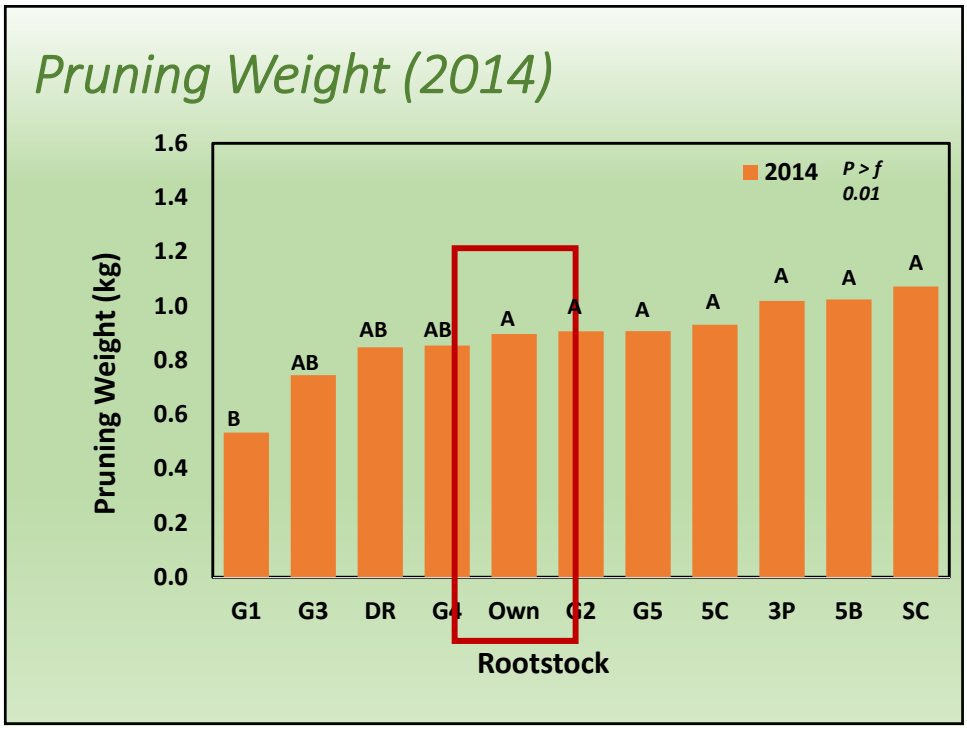
[a] ns, *, **, *** indicate not significant, and statistically significant at the 0.05, 0.01, and 0.001 levels of probability respectively.
[b] not presented.
[c] Fischer's least significant difference test.
[d] means followed by different letters are significantly different

ndustry, Texas
Planted in Fall 2012

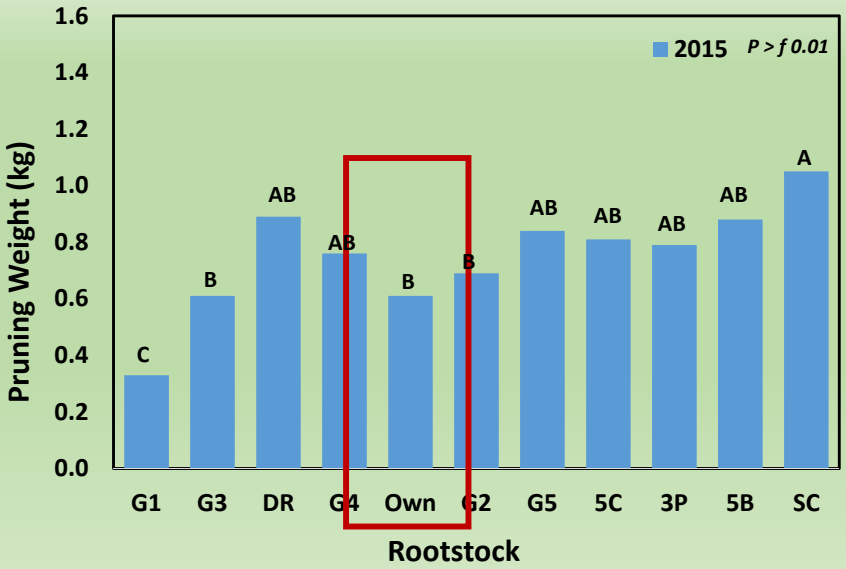
- **Scion: *Vitis spp. cv. 'Blanc Du Bois'***
- **Cuero Loam**
- **Soil pH: 8.2**
- **2.7' x 1.8m, Geneva Double Curtain**



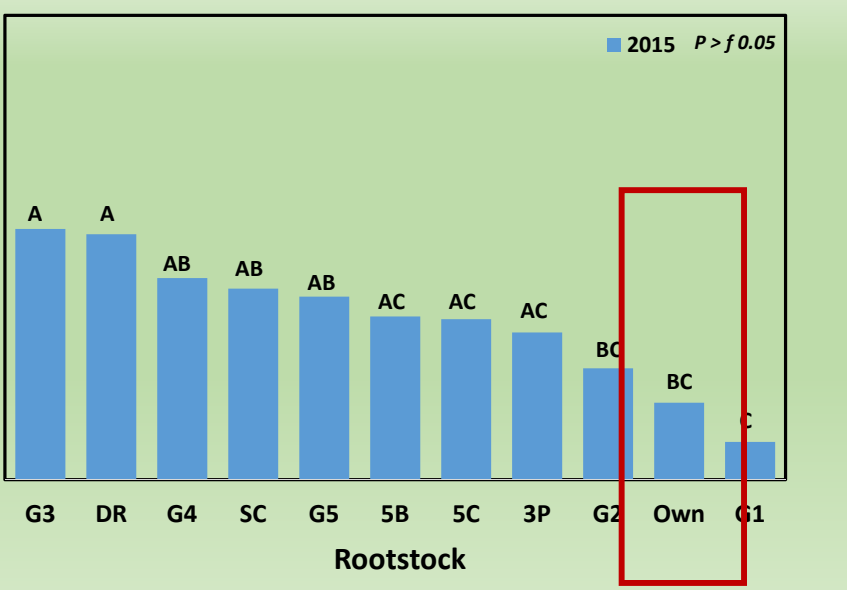
Common Rootstocks	Reported CRR Tolerance	Nematode Resistance
1103 Paulsen	Dogridge	UCD GRN-1
Kober 5BB	Salt Creek (Ramsey)	UCD GRN-2
Teleki 5C	Florilush	UCD GRN-3
Own		UCD GRN-4
		UCD GRN-5



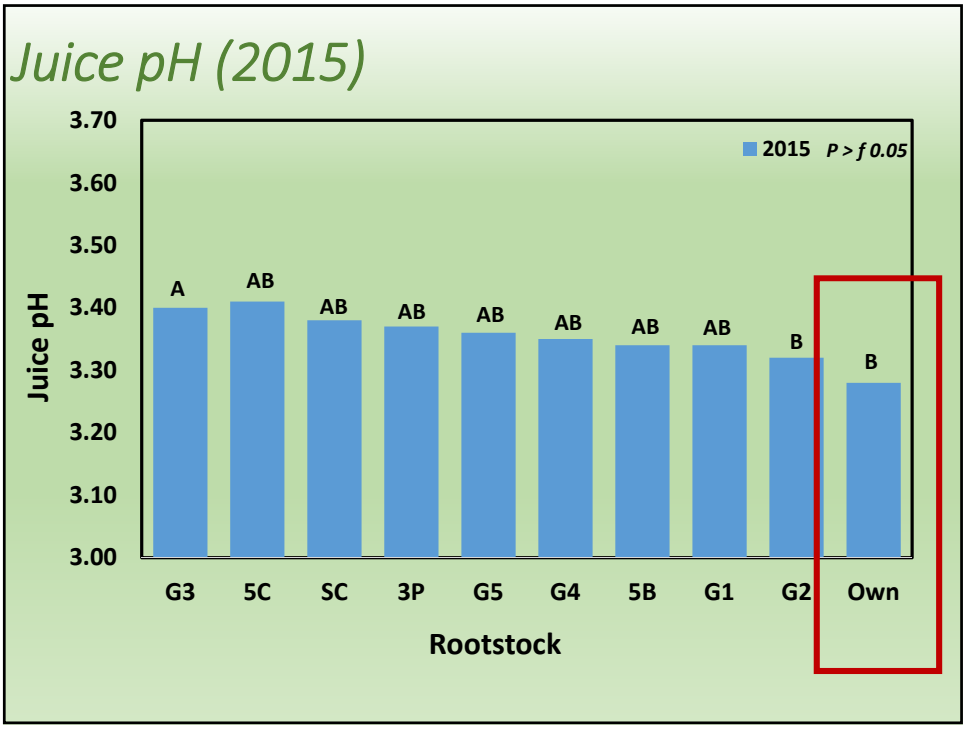
Pruning Weight (2015)



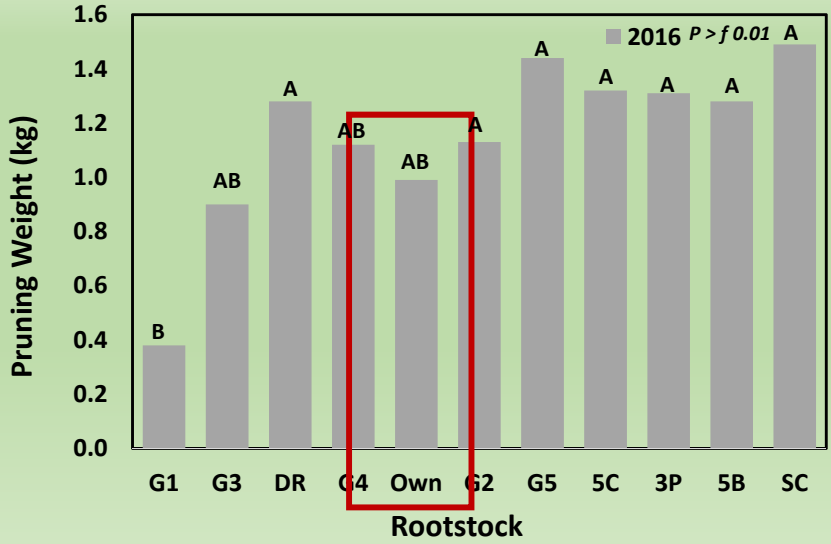
Soluble Solids (2015)

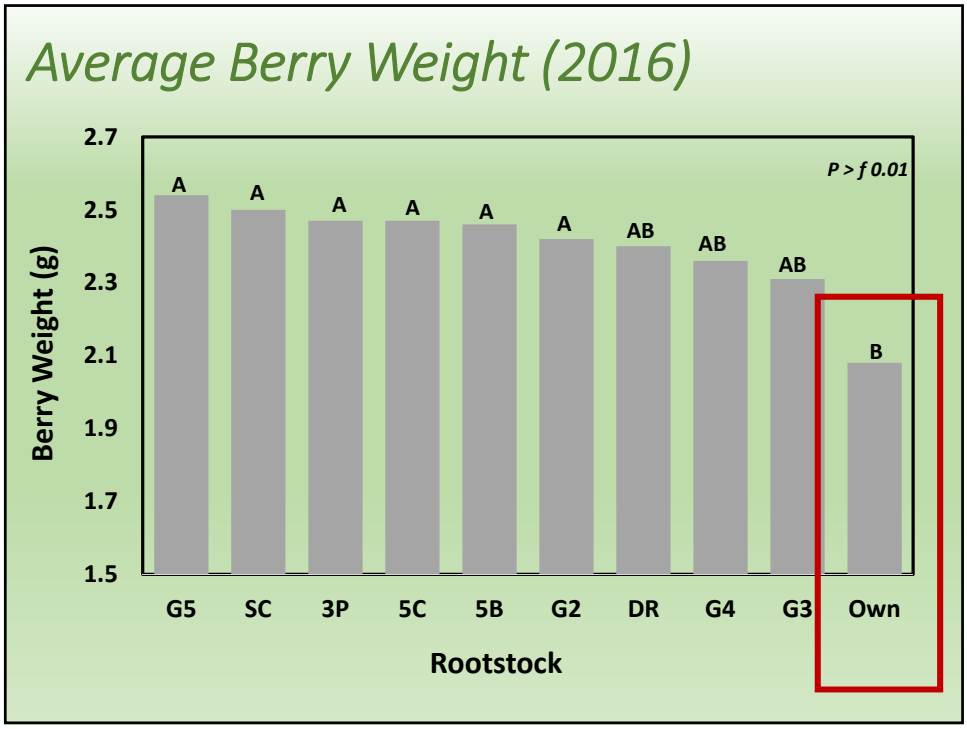


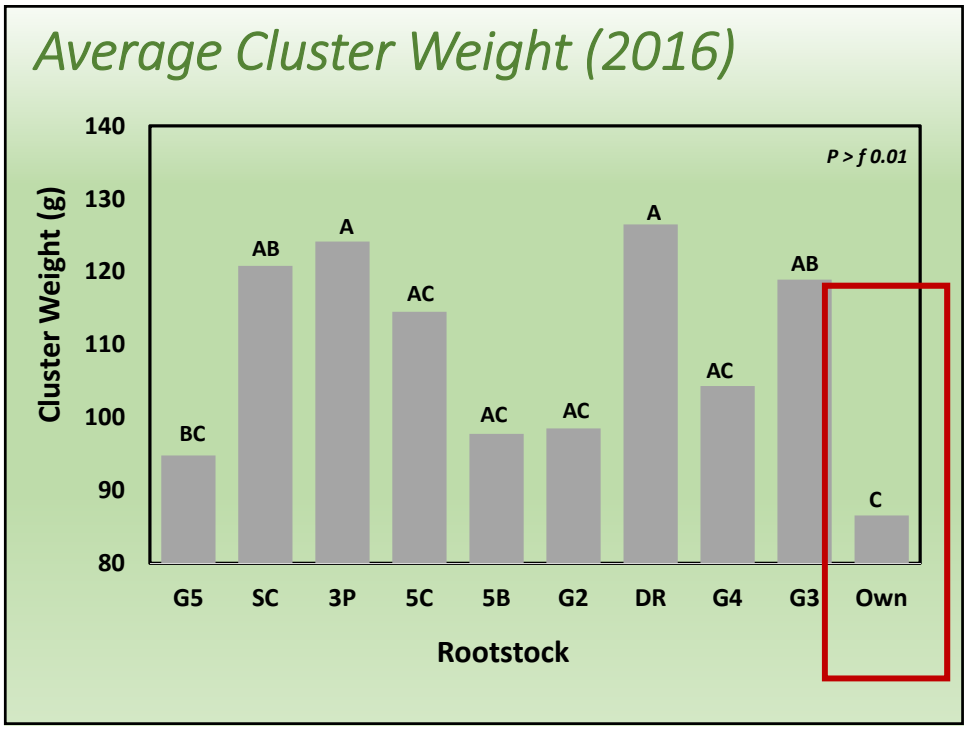
Juice pH (2015)



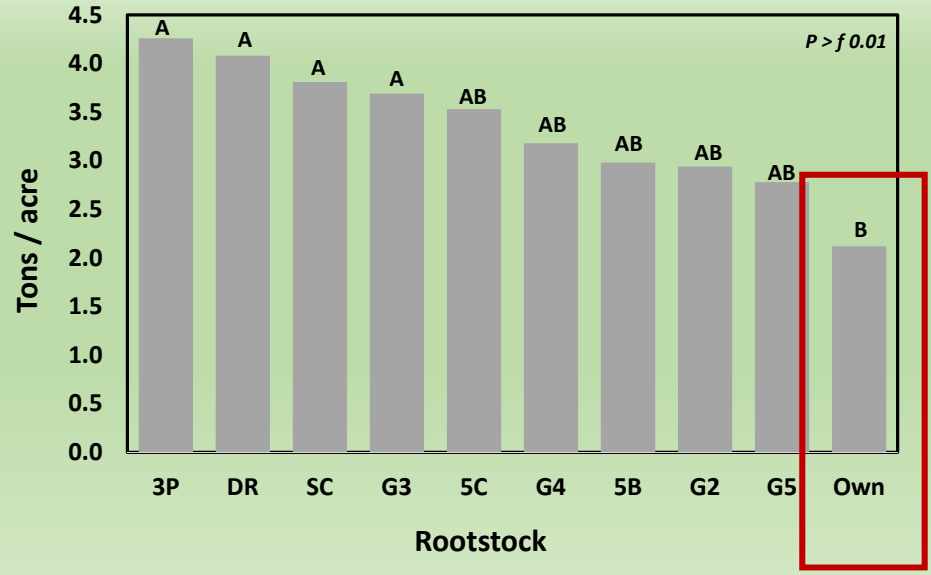
Pruning Weight (2016)



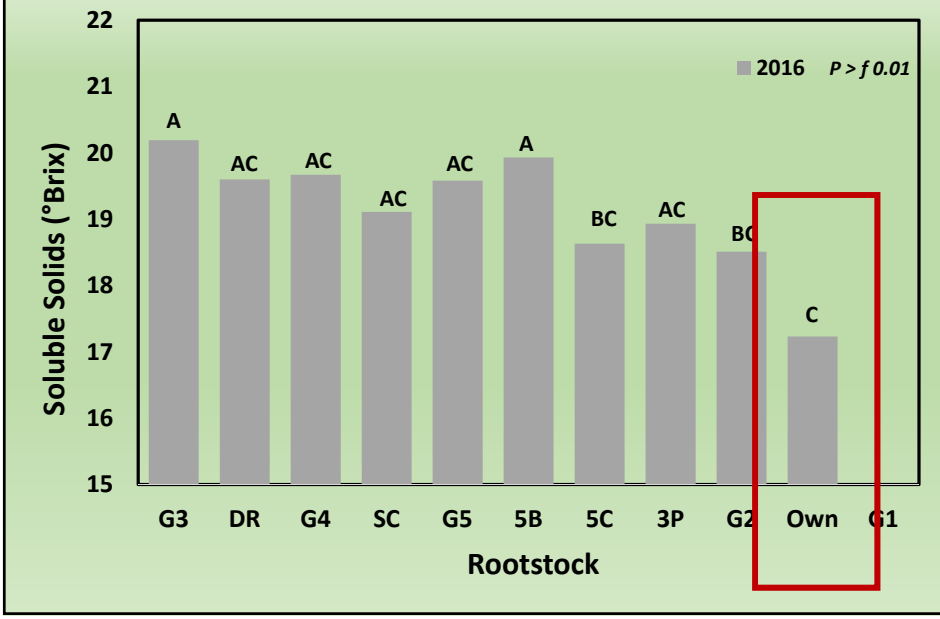

Average Berry Weight (2016)
P > f 0.01
Berry Weight (g)
2.7
2.5
2.3
2.1
1.9
1.7
1.5
A
A
A
A
A
A
AB
AB
AB
B
G5
SC
3P
5C
5B
G2
DR
G4
G3
Own
Rootstock


Average Cluster Weight (2016)
P > f 0.01
Cluster Weight (g)
140
130
120
110
100
90
80
BC
AB
A
AC
AC
AC
A
AC
AB
C
G5
SC
3P
5C
5B
G2
DR
G4
G3
Own
Rootstock

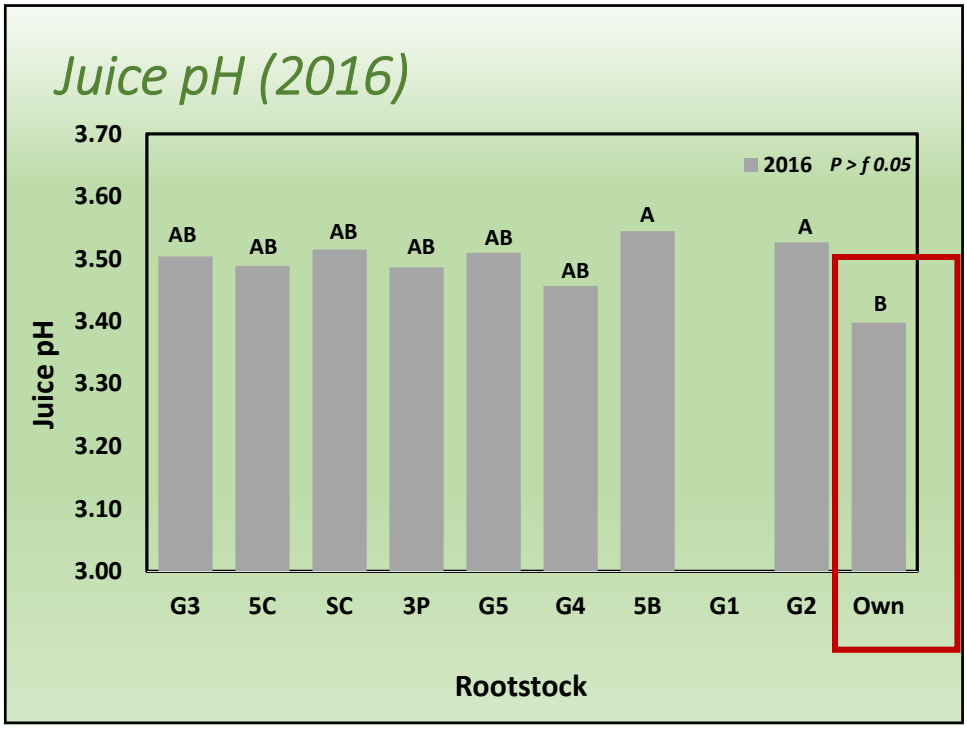
Projected Yield (2016)



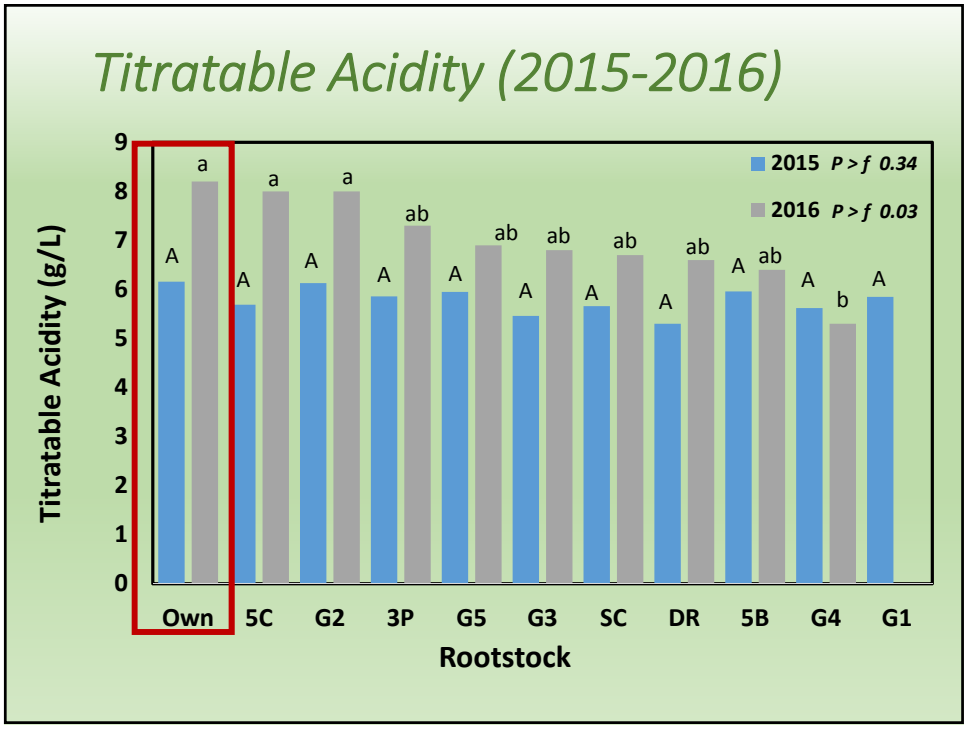
Soluble Solids (2016)



Juice pH (2016)



Titratable Acidity (2015-2016)

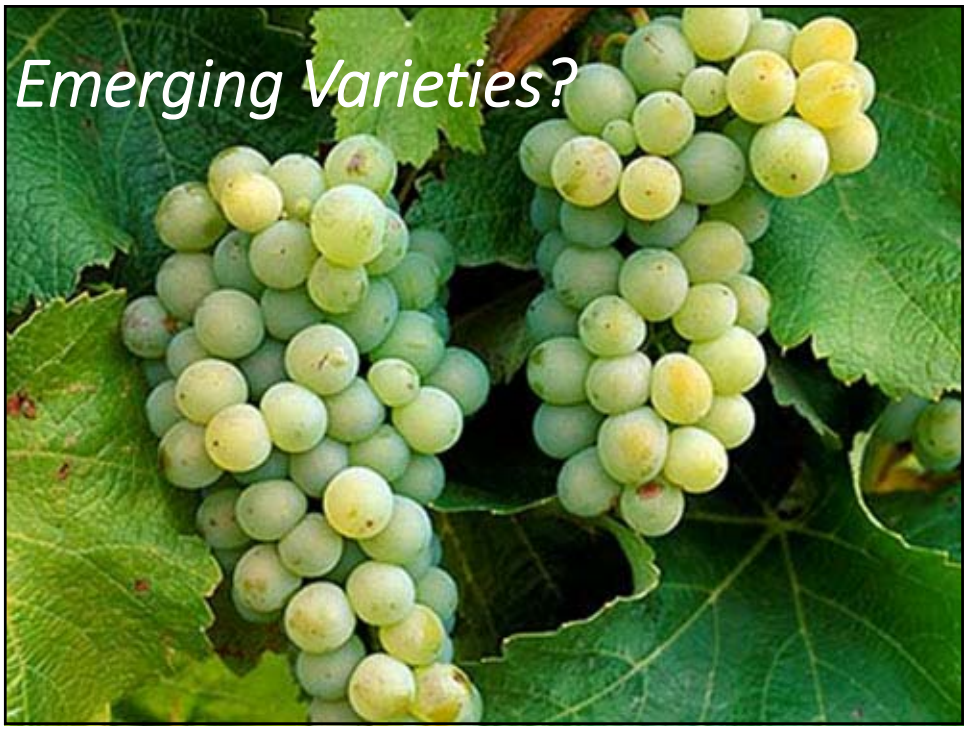


Same Variety, Same Day



Photos Bri Hoge

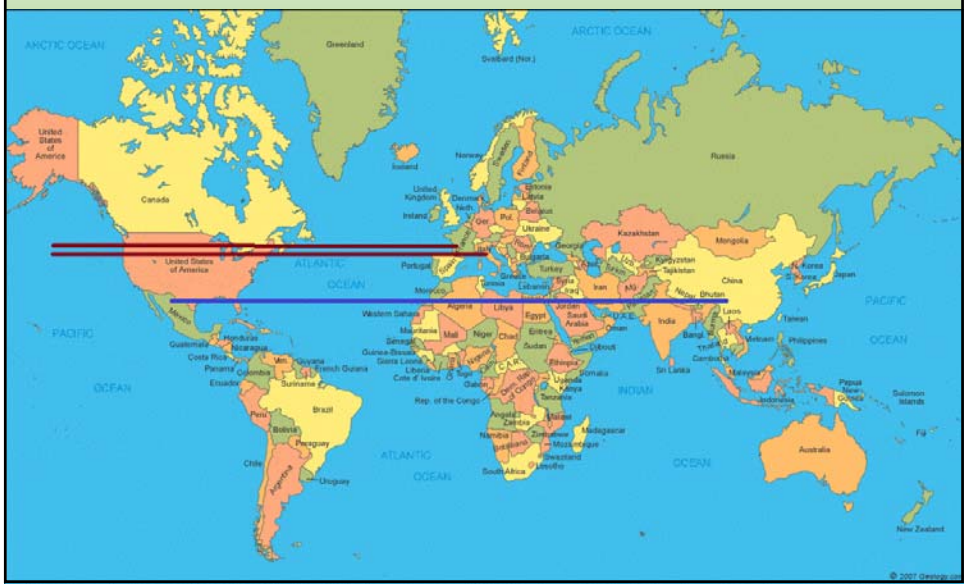
Emerging Varieties?



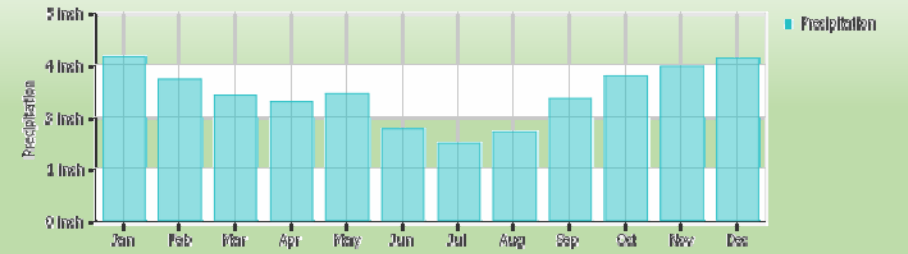
Geographic Illusion

"You know, we went to Bordeaux/Tuscany on vacation, and parts of Texas are exactly like that. Its got to be a good place to grow grapes"

Geographic Reality

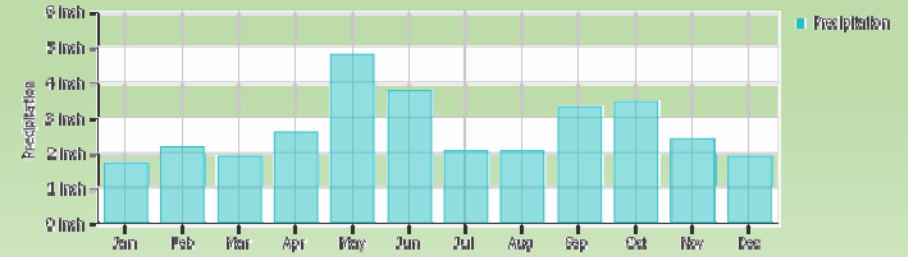


Comparative Rainfall & Temperature Data-Bordeaux & Austin



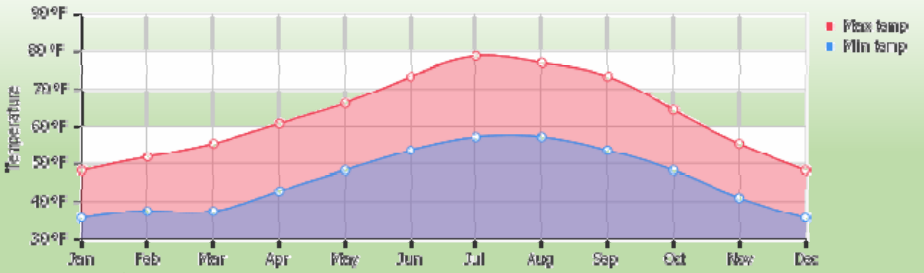
Bordeaux

Average precipitation (rain/snow) in Bordeaux, France Copyright © 2016 www.weather-and-climate.com



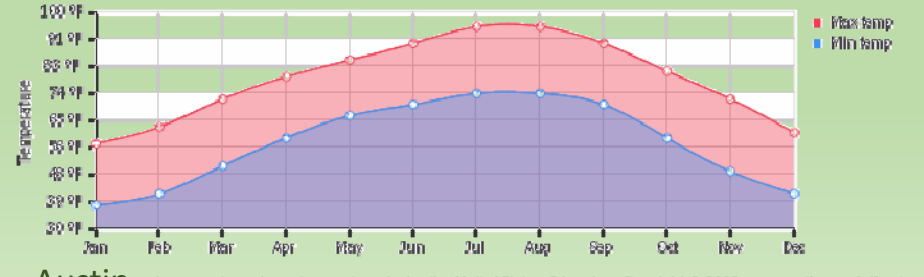
Austin

Average precipitation (rain/snow) in Austin, United States of America Copyright © 2016 www.weather-and-climate.com



Bordeaux

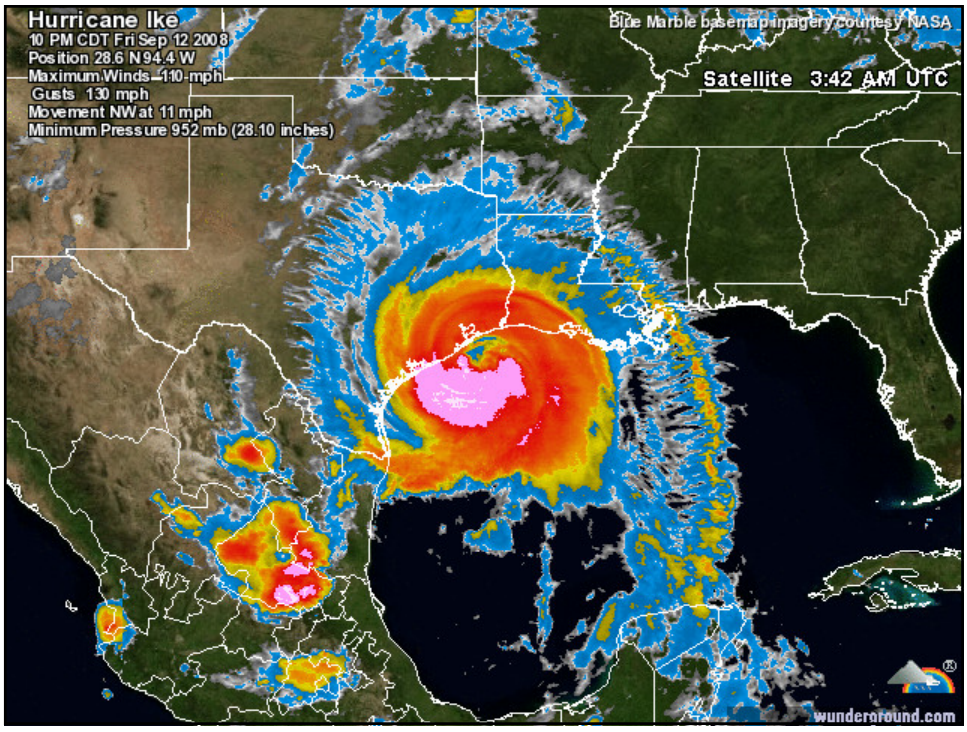
Average min and max temperatures in Bordeaux, France Copyright © 2016 www.weather-and-climate.com



Austin

Average min and max temperatures in Austin, United States of America Copyright © 2016 www.weather-and-climate.com


VIGNOBLES D'EUROPE
Bay of Biscay
Adriatic Sea
Ionian Sea
Tyrrhenian Sea
Balearic Sea
Mediterranean Sea
Alboran Sea


Hurricane Ike
10 PM CDT Fri Sep 12 2008
Position 28.6 N 94.4 W
Maximum Winds 110 mph
Gusts 130 mph
Movement NW at 11 mph
Minimum Pressure 952 mb (28.10 inches)
Blue Marble basemap imagery courtesy NASA
Satellite 3:42 AM UTC
wunderground.com

Traits to Look For…

- Variety Adaptation to Hot Climates- Capable of Consistently Producing High Quality Wine
- Appropriate Cold Hardiness for Given Location
- Late Budbreak to Avoid Spring Frost
- Loose Cluster Architecture
- Acceptable Disease Resistance
- High Demand By Wineries

Varieties to Consider Avoiding

- 'Chardonnay'- Fruit Quality is Great, but Very High Risk of Spring Frost
- 'Pinot Noir', 'Zinfandel', 'Pinot Gris', 'Sauvignon Blanc'- Very Thin Skinned and Very Tight Clusters- Very High Risk of Late Season Rot
- 'Cabernet Sauvignon'- Fine in the High Plains, Some Can Grow Great Fruit in the Hill Country, but Southern Locations Lack Color and Acidity

Standard Red Varieties for Texas

- **'Tempranillo'-** Good Quality, Dependable Producer, problems with Must pH
- **'Mourvedre'-** Excellent Quality, Easy to Manage, Versatile, Late Bud Break…. Overplanted?
- **'Durif' ('Petit Syrah')-** Excellent Quality, Tight Clustered, Will Be More Planted
- **'Malbec**'- No, this is not Bordeaux, But Very High Quality if Cropped Correctly
- **'Montepulciano'-** Good Quality, Late Budbreak, Apparently Cold Hardy Enough for High Plains
- **'Sangiovese'-** Great Quality But Frost Susceptible and Very Downy Mildew Susceptible
- **'Syrah'-** A Princess. Quality Can Be Outstanding, but Must Be on the Right Site and Stock

Standard White Varieties for Texas

- **'Viognier'-** Delicate Vine, but Produces Spicy Wine With Growing Consumer Acceptance. Overplanted?
- **'Rousanne'-** Great Quality, Retains Acidity But Tight Clustered and a Potential Rot Problem
- **'Vermentino'-** Great Quality, Loose Clusters, Dependable Producer. Clean Wood Not Yet Widely Available

Growing Interest

- Reds
  - 'Tannat'
  - 'Touriga Nacional'
  - 'Grenache'
  - 'Barbera'
- Whites
  - 'Albaranio'
  - 'Marsanne'
  - 'Piquepoul Blanc' ?
  - 'Semillon'

There is a Trend toward Planting "adapted", but Untried Varieties 'Cunoise'????

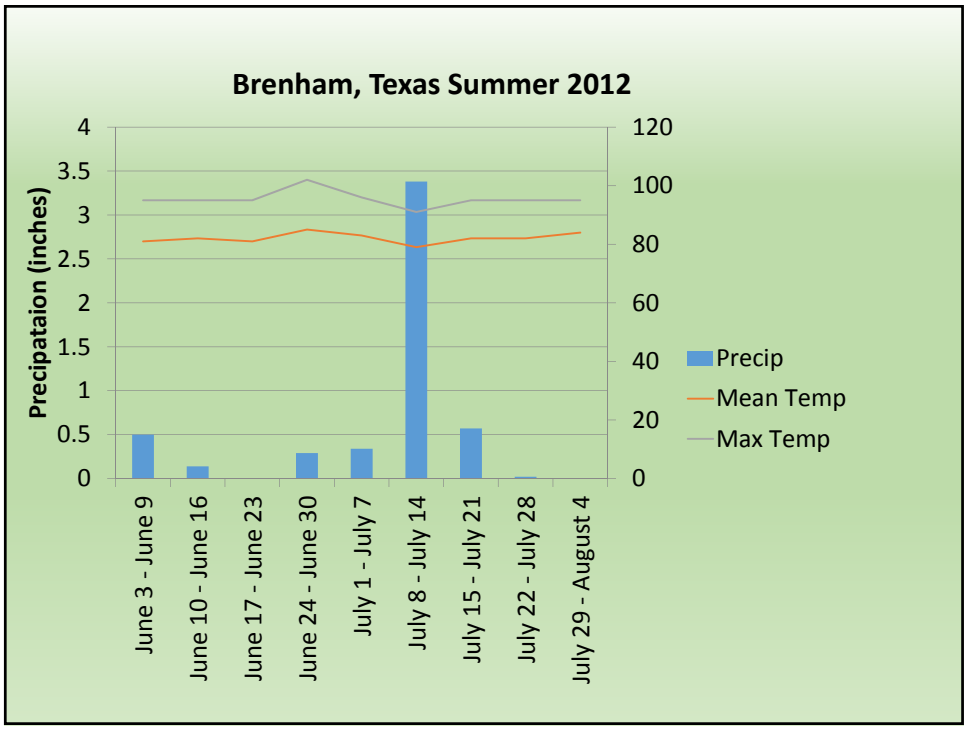
Texas grapevine evaluations
Focus on traditional breeding






2012 Harvest Data for Industry, Texas Experimental Vineyard

Variety	Harvest Date	Brix	pH	TA (g/L)	Berry weight (g)	Cluster weight (kg)	Berries / Cluster	Tons / Acre
U0505-35	6/27	21.2	3.62	7.83	*	0.08	*	1.18
Phoenix	6/27	18.0	3.79	5.27	*	0.11	*	2.28
Orion	6/27	19.0	3.5	5.80	*	0.11	*	2.33
Blanc du Bois	7/3	19.6	3.46	6.35	2.62	0.11	41.6	4.21
U0502-20	7/10	18.6	3.59	6.45	1.77	0.17	93	0.96
U0502-38	7/10	22.6	3.98	6.75	1.62	0.06	34.2	1.3
044-6-5	7/10	18.0	3.29	5.27	1.19	0.09	71.9	1.22
Victoria Red	7/10	19.2	4.06	3.60	6.53	0.36	55.2	1.84
U0502-26	7/17	20.0	3.48	6.60	2.41	0.14	58.08	1.8
A24-6-6	7/17	18.0	3.45	5.55	2.08	0.12	57.69	4.59
Edsal	7/17	19.8	3.54	4.05	1.55	0.09	57.69	2.29
Bailey	7/24	14.0	3.43	6.00	3.83	0.18	47.5	3.49
Carmen	7/24	19.4	3.65	4.60	2.29	0.15	65.07	2.94
U0502-10	7/24	19.0	3.64	6.00	1.7	0.18	102.9	*
Lomanto	7/24	14.6	3.45	7.20	2.13	0.95	44.6	2.34
MH White	7/24	17.2	3.59	4.50	3.6	0.26	72.22	3.6
D6-12-1	7/24	18.0	3.64	4.80	1.08	0.06	50.93	1.48
Miss Blanc	7/26	17.0	3.60	7.35	2.6	0.12	46.15	2.48



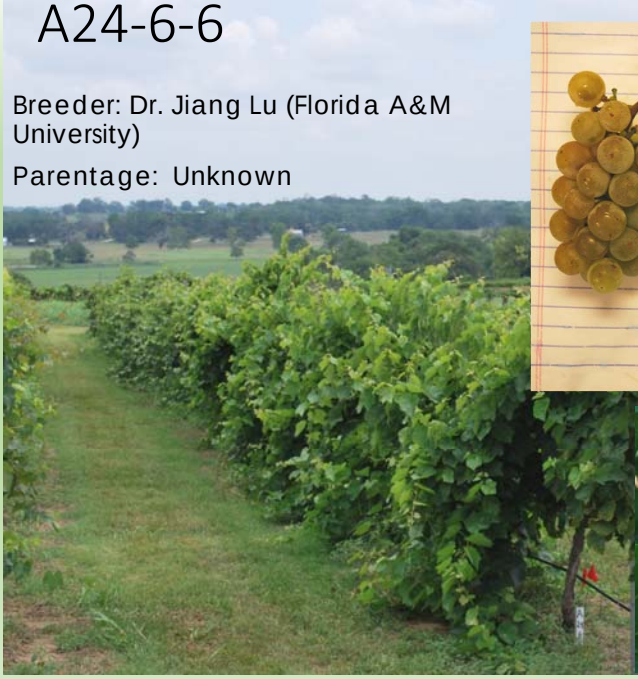
Red Varieties	Max Brix	pH	TA
U0502-38	23	3.98	6.75
U0505-35	21	3.62	7.83
U0502-26	20	3.48	6.6
Carmen	20	3.65	4.6
U0502-10	19	3.64	6
D6-12-4	19	3.64	4.8
O44-6-5	18	3.29	5.27
Lomanto (own)	16	3.45	5.7
Delicatessen	16	3.34	3.1
Ben Hur	15	3.5	3.75
Bailey	14	3.43	6
O47-3-7	14	3.6	6.75
C30-7-1	14	3.34	7.99
Miss Blue	13	3.24	6.45
Lomanto	13	3.3	6.15
C30-5-1	13	2.98	9.15
Wine King	12	3.22	7.5
D16-13-1	12	3.29	7.2

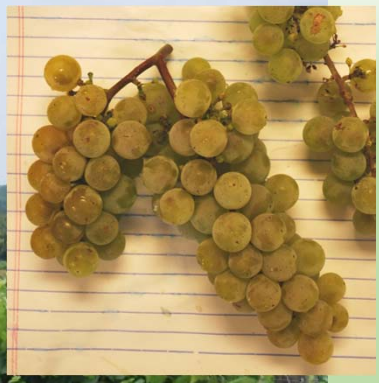
Lomanto

- **Breeder: Munson (1902)**
- **Parentage: Salado (*V. champinii, V. labrusca, V. bourquiniana*) x Pense (*V. vinifera*?)**

A24-6-6

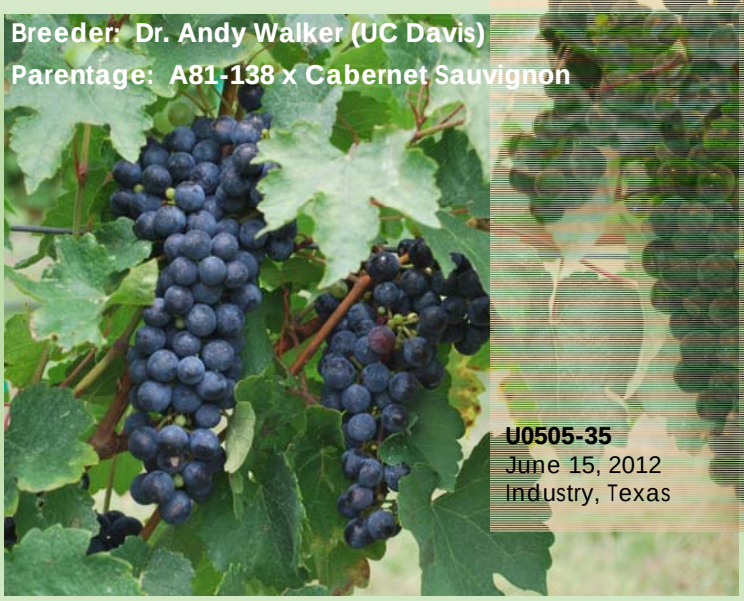
- Breeder: Dr. Jiang Lu (Florida A&M University)
- Parentage: Unknown





U0505-35

- **Breeder: Dr. Andy Walker (UC Davis)**
- **Parentage: A81-138 x Cabernet Sauvignon**



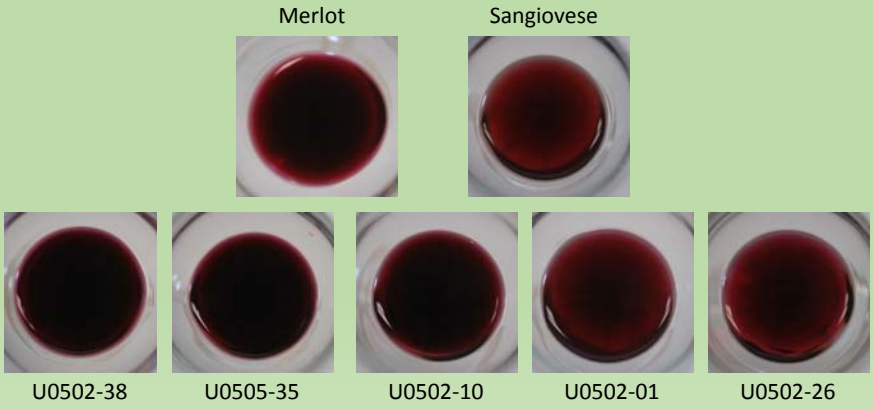
U0505-35
June 15, 2012
Industry, Texas

2013 Variety	Parentage	Color	Vineyard	Date	˚Brix	pH	TA
U0502-20	50% Chardonnay	White	Leakey	7/26/14	24.4	3.72	6.4
			Hye	7/29/14	25.5	4.09	7.8
			Industry	8/6/14	18.0	3.42	-
U0502-38	50% Chardonnay	Red	Leakey	7/26/14	25.0	3.79	6.3
			Hye	7/25/14	24.0	4.02	8.0
			Industry	8/6/14	22.1	4.00	
U0505-35	50% Cabernet Sauvignon	Red	Leakey	-	-	-	-
			Hye	7/29/14	24.9	3.97	8.4
			Industry	7/28/14	21.5	3.38	-

Variety Trial Harvest 2014

Variety	Parentage	Color	Vineyard	Date	Brix	pH	TA
U0502-20	50% Chardonnay	White	Leakey	7/26/14	24.4	3.72	6.4
			Hye	7/29/14	25.5	4.09	7.8
			Industry	8/6/14	18.0	3.42	-
U0502-38	50% Chardonnay	Red	Leakey	7/26/14	25.0	3.79	6.3
			Hye	7/25/14	24.0	4.02	8.0
			Industry	8/6/14	22.1	4.00	
U0505-35	50% Cabernet Sauvignon	Red	Leakey	-	-	-	-
			Hye	7/29/14	24.9	3.97	8.4
			Industry	7/28/14	21.5	3.38	-
U0502-10	50% Chardonnay	Red	Leakey	7/26/14	24.4	3.72	6.4
			Hye	7/29/14	25.5	4.09	7.8
			Industry	8/19/14	19.8	3.81	-
U0502-26	50% Chardonnay	Red	Leakey	7/28/14	23.9	3.81	5.85
			Hye	-	-	-	-
			Industry	8/19/14	19.1	3.8	
U0501-12	50% Syrah	Red	Leakey	-	-	-	-
			Hye	8/19/12	26.2	4.15	4.92
U0501-01	50% Chardonnay	Red	Leakey	8/5/14	25.1	3.86	4.85
			Hye	8/6/14	23.3	4.13	4.95

2014 Harvest – Hill Country



94 % Walker Selections

- 07355-75- Excellent… of course, he released it
- 07713-51- Beautiful straw colored white, chardonnayesque
- 07370-84- Fantastic golden colored white, spicy
- 07329-31- dog

Fruit Chemistry 2017
94% & 88% Selections

• 07355-75	22.8 °B	3.51 pH
• 07713-51	23.7 °B	3.61 pH
• 07370-84	22.8 °B	3.57 pH
• U0502-38	27.5 °B	3.66 pH
• U0505-35	23.2 °B	3.81 pH
• U0502-20	22.0 °B	3.47 pH

First Releases from Andy Walker

50% Petite Sirah, 25% Cab Sauv P

Caymus, Sonoma,

Early bloom, early ripening

Relatively large berries, medium large clusters

Medium productivity

Thanks to ETS Labs

First Releases from Andy Walker

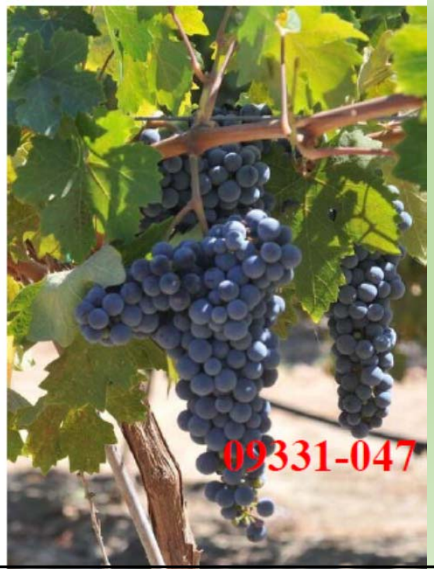
50% Zinf, 25% Petite Sirah, 12.5% Cab Sauv P

Caymus, Temecula, Silverado

Late bloom, mid-season ripening

Relatively large berries, large clusters

Moderate-low productivity



First Releases from Andy Walker

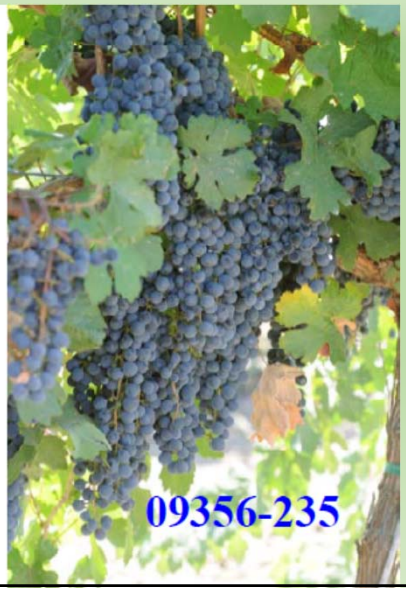
50% Sylvaner, 12.5% Cabernet Sauvignon, Carignane, Chardonnay N

Davis only

Mid-season bloom and ripening

Large berries, loose medium clusters

High productivity



First Releases from Andy Walker

62.5% Cab Sauv, 12.5% Carig, 12.5% Chard N

Temecula, Sonoma, Silverado

Early bloom, early ripening

Small - medium berries, medium large clusters

High productivity

First Releases from Andy Walker

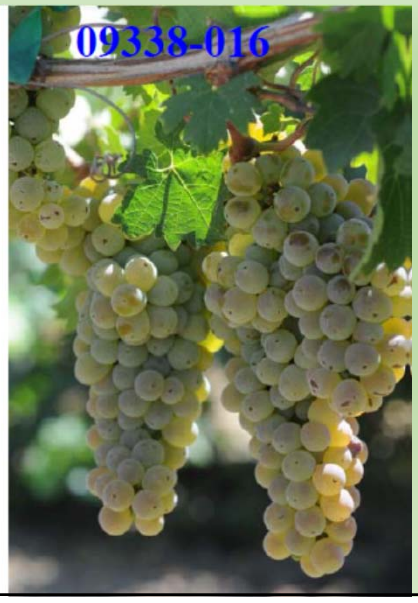
62.5% Cab Sauv, 12.5% Carig, 12.5% Chard N

Davis only

Late bloom, mid-season ripening

Small berries, small clusters

Medium productivity



Questions?